Chapter 5 – Economic and Environmental Issues and Constraints

This chapter describes the logistics industry's role in generating jobs and economic activity within the study region and identifies the environmental and community impacts associated with goods movement. This chapter also includes current efforts that are underway to address environmental impacts. More information about these topics are included in Tech Memos 5a (Economic Benefits and Costs of Growth in Goods Movement) and 5b (Environmental and Community Impacts).

Economic Effects

To estimate the total volume of economic activity generated by the logistics sector throughout the study region, the total economic activity (or spending), total value added (or gross domestic product), total jobs (e.g., wages and salary, income or spending power generated by this industry and indirect business taxes property taxes, fees, licenses and excise taxes paid to the government) have to be examined. For example, Southern California's goods movement sectors create considerable positive affects on the regional and national economy due to the variety of activities involved in moving goods. In particular, all subsectors within the logistics industry (e.g., wholesale trade, trucking, supply management, warehousing, couriers, air, sea, and rail transportation) grew from 1990 to 2005 by 103,400 jobs (18.4 percent) and are competitively situated to continue to grow. In addition, Southern California's burgeoning population requires a logistics sector that matches its size and growth. The rapid growth of e-commerce and associated "just-in-time" delivery is adding to this pressure and a major difficulty for the logistics sector is the fact that it is straining the facilities and supporting infrastructure needed to accommodate the increased velocity, decreased shelf time, and anticipated growth in trade. Further, environmental and community impacts have economic costs (e.g., public health care) that have to be considered. These costs must ultimately be weighed against the benefits associated with goods movement. Environmental and community impacts are discussed in the next section.

As shown in Tech Memo 5a, in 2005, the Ports of Los Angeles and Long Beach were ranked second and third in their dollar volume of U.S. international trade and Los Angeles International Airport (LAX) was ranked seventh. In container terms, these ports, in combination with the Port of San Diego and Port Hueneme, handled 41.8 percent of 2005 U.S. imports and 68.4 percent of all containers reach the West Coast (including Vancouver).

The direct economic impact of logistics activities within the study region includes:

- $90.7 billion, or 6.6 percent, of the total $1,375 billion in economic activity.
- $63.6 billion, or 7.8 percent, of the total $812.6 billion in economic value created.
- 687,837, or 6.1 percent, of the total 11,321,518 people employed.
- $52.6 billion, or 7.0 percent, of the total $750.6 billion earned income.
- $11.1 billion, or 17.8 percent, of the total $62.0 billion in sales taxes, property taxes, fees, licenses, and excise taxes paid to government.

The indirect and induced impact of logistics activities within the study region (due to activities in other sectors and throughout the economy) include:

- $170.4 billion, or 12.4 percent, of the total $1,375 billion in economic activity.
- $113.2 billion, or 13.9 percent, of the total $812.6 billion in economic value created.
- 1,441,016, or 12.7 percent, of the total 11,321,518 people employed.
- $98.6 billion, or 13.1 percent, of the total $750.6 billion earned income.

- $14.6 billion, or 23.5 percent, of the total $62.0 billion in tax and fee revenues to government.
- Each new logistics job supports a total of 2.19 new jobs in the economy.
- A $1.00 increase in logistics activity initiates a total of 1.97 times that amount in the local economy.

Also, Table 17 shows a surplus of $176.5 billion in international trade through California, which exceeds the amount of shipments destined for California handled by other states. This table highlights the disproportionate role of California as a gateway for international trade.

Table 17

California's Aggregate International Trade-Related Shipping Services Surplus, 2000

	Shipments for California Through Other States[1]	Shipments for Other States Through California[2]	Shipping Services Surplus
	Billions of Dollars		
Exports	[illegible]	[illegible]	[illegible]
Imports	[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]	[illegible]
	Billions of Tons		
Exports	[illegible]	[illegible]	[illegible]
Imports	[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]	[illegible]

[1] These figures include both imports for California that arrive on U.S. vessels in other states and the domestic exports that depart from U.S. shores via ports located in other states.

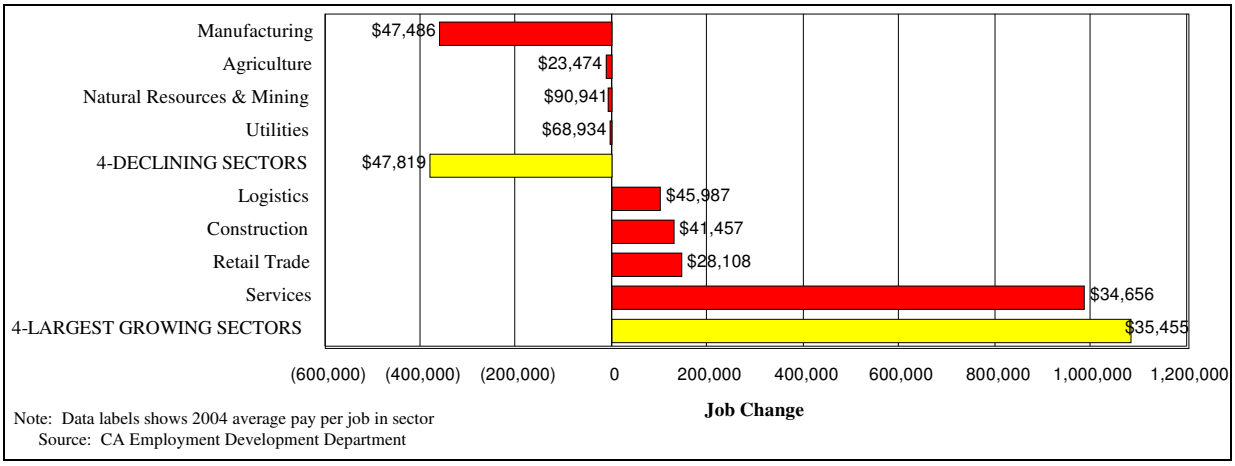
[2] Similarly, the figures in this column also account for both imports arriving in California and exports departing the rest of the country.

Source: California's Global Gateways: Trends and Issues; Haveman & Hummels, 2004.

As of 2006, 21.3 million people live in the six county study area and Imperial County, of which approximately 43.8 percent have no formal college training. By 2030, forecasters expect this number to increase to 26.8 million. Historically the manufacturing industry provided good entry-level pay and job ladders that allowed many people to eventually earn middle class wages. Middle class is defined as the income range containing the 12.5 percent of Southern California's households below ($37,163) and above ($66,099) its 2004 median income of $49,435.

With average manufacturing pay at $47,486 per job in 2004, the manufacturing sector has been largely responsible for the vast majority of jobs lost in Southern California's four major declining sectors, removing 381,000 jobs with an average pay of $47,819, as shown in Figure 26. Furthermore, from 1990-2005, the four sectors (logistics, construction, retail trade, and services) adding the most new jobs to Southern California's economy, grew by 1,083,000 positions. However, in 2004, the average pay for these sectors was only $35,455. There has been a $12,000 difference between the pay in shrinking sectors versus that in the four fastest-growing sectors due to the prevalence of lower paying retail trade ($28,108) and the full range of service sectors ($35,455) in the region's job growth. This is likely a major contributing factor for Southern California's falling per capita income ranking.

Figure 26
Major Gaining & Losing Sectors, Southern California
Size of Job Change, 1990-2005 Average Pay



The logistics industry has the potential to replace manufacturing in its role of providing good entry-level pay and job ladders for people without advanced schooling because it offers a median beginning pay at 32.1 percent above the minimum wage ($8.91 or $18,542 per year) and it has defined paths by which workers can graduate to median pay levels that exceed $40,000 per year. Moreover, the average pay for all logistics jobs in 2005 was $47,411 per year, just 2 percent below all manufacturing jobs ($48,397).

In addition, the overall pay in logistics subsectors appear to run 12.5 percent to 14.4 percent above that derived from the general occupational pay scales used to calculate incomes. For example, in the wholesale trade subsectors, 80.6 percent of the jobs require no advanced schooling and another 5.7 percent require either trade or community college training. In transportation and warehousing subsectors, 92.9 percent of the jobs require no advanced schooling and another 1.1 percent requires trade school training. Lastly, the entry pay of the logistics subsectors are very competitive when compared to alternative sectors without educational barriers such as:

- Retail trade ($28,840)
- Gaming ($28,385)
- Accommodation ($24,019)
- Agriculture ($22,793)
- Other services (automotive, household and electric repair and maintenance, personal care, laundry, member associations, household workers) ($22,340),
- Eating and drinking ($15,132)

Table 18 shows "multipliers" or the extent to which increases in logistics activity, caused by money entering the region from elsewhere, will impact the full economy. The analysis found that each new logistics job supports a total of 2.19 new jobs in the economy. A $1.00 increase in logistics activity sets off a total of 1.97 times that amount in the local economy. Similar ratios were determined for the impact of additional jobs or activity in each of the major subsectors of logistics listed in Table 18.

Table 18
Logistics Subsectors Output and Employment Multipliers

Logistics Sector		Direct Impact	Indirect Impact	Induced Impact	Total Impact	Total Multiplier
Wholesale Trade Only	$	$1,000,000,000	$239,235,367	$712,566,964	$1,951,802,331	**1.95**
	Jobs	7,166	2,009	7,211	16,386	**2.29**
Air Transportation	$	$1,000,000,000	$509,515,482	$540,084,339	$2,049,599,821	**2.05**
	Jobs	4,541	3,765	5,241	13,547	**2.98**
Rail Transportation	$	$1,000,000,000	$307,172,558	$510,291,441	$1,817,463,999	**1.82**
	Jobs	3,943	2,283	4,885	11,111	**2.82**
Water Transportation	$	$1,000,000,000	$380,790,248	$472,802,455	$1,853,592,703	**1.85**
	Jobs	2,147	5,417	4,601	12,165	**5.67**
Truck Transportation	$	$1,000,000,000	$520,062,441	$592,974,407	$2,113,036,848	**2.11**
	Jobs	9,280	3,630	5,659	18,569	**2.00**
Couriers	$	$1,000,000,000	$293,998,557	$591,121,230	$1,885,119,787	**1.89**
	Jobs	15,122	1,988	5,621	22,731	**1.50**
Warehousing & Storage	$	$1,000,000,000	$244,287,506	$597,373,127	$1,841,660,633	**1.84**
	Jobs	11,204	1,763	5,652	18,619	**1.66**

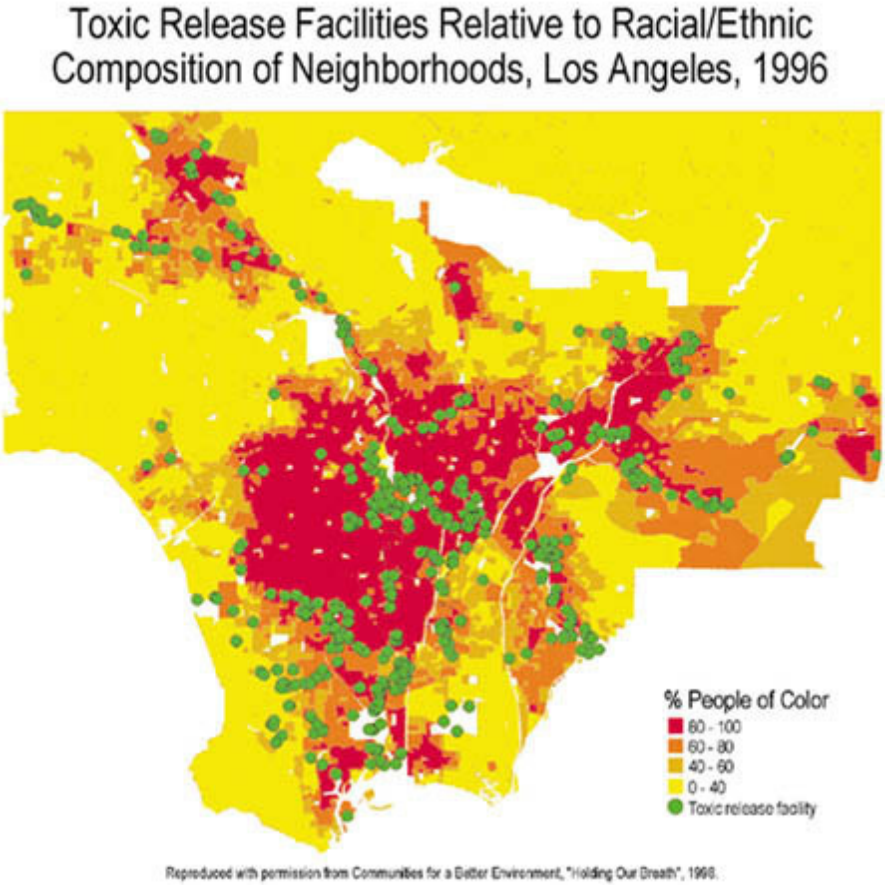
Source: IMPLAN Model Used with $1,000,000,000 assumption for each logistics subsector

Environmental and Community Impacts

While specific environmental and community impacts and mitigation measures are numerous, vary widely, and require more detailed analysis that is beyond the scope of this multi-county study, there are common issues and concerns that resonant throughout the study region worth noting. These include, but are not limited to, air quality, health, noise, light, visual (e.g., stacked containers), vibration, safety, water quality, quality of life, traffic congestion, and environmental justice issues .

Emerging health problems and environmental justice issues linked to goods movement are of particular concern to community groups given the mixed land uses in many lower-income Southern California neighborhoods. Environmental justice is of particular concern for communities in proximity to the ports (Long Beach, Los Angeles, Hueneme, and San Diego), major goods movement corridors, facilities, equipment, and industrial operations. Environmental justice is defined by state law as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies." Figure 27 illustrates the racial/ethnic composition of the neighborhoods in Los Angeles County in 1996.

Figure 27



A significant percentage of residents in neighborhoods adjacent to the study region's ports are ethnic minorities and/or live below the poverty line. According to the 2000 census, approximately 23 percent of the population in the City of Long Beach was below the poverty line, and approximately 67 percent of the population was defined as a minority group. In the City of Port Hueneme, the 2000 census identified approximately 12 percent of the population living below the poverty line and approximately 43 percent of the population was defined as a minority group. Of the City of Los Angeles' 3.9 million residents, 70,000 live in San Pedro, a working class community where about two-thirds of residents are Latino, and 22 percent live below the poverty line.[1] Additionally, in the Barrio Logan neighborhood**s** surrounding the Port of San Diego, the 1990 census reported approximately 41 percent of the population living below the poverty line and approximately 93 percent of the population was defined as a minority group.

In addition, environmental and community health impacts are felt throughout the study region. For example, a recent University of Southern California publication has shown decreased lung capacity among residents living near goods movement facilities and major highway corridors. The document revealed that "children who lived within 500 meters of a freeway, or approximately a third of a mile, since age 10 had substantial deficits in lung function by the age of 18, compared to children living at least 1,500 meters, or approximately one mile, away."

The impacts of goods movement on the environment and community result in increased health care costs and greater health risks to specific populations. As shown in Figure 28, there are high costs associated with

environmental impacts of goods movement which in turn impacts the region's economy. Figure 29 highlights the increased cancer risk for populations living in Los Angeles and the vicinity. It also shows cancer risks are elevated near goods movement facilities and major highway corridors. Figure 30 shows the increased cancer risk for populations living within the South Coast Air Basin.

Figure 28

Annual (2005) Health Effects of PM and Ozone Pollution from Freight Transport in California[65]

Health Outcome[A]	Cases per Year	2005 Valuation ($ Millions)
Premature Death[B]	2,400	19,000
Hospital Admissions (respiratory causes)	2,000	67
Hospital Admissions (cardiovascular causes)	830	34
Asthma and Other Lower Respiratory Symptoms	62,000	1.1
Acute Bronchitis	5,100	2.2
Work Loss Days	360,000	65
Minor Restricted Activity Days	3,900,000	230
School Absence Days	1,100,000	100
Total	**NA**	**19,499**

Source: California Air Resources Board, March 2006.

A Does not include the contributions from particle sulfate formed from SOx emissions, which is being addressed with several ongoing emissions, measurement, and modeling studies.

B Includes cardiopulmonary- and lung cancer-related deaths.

.

According to CARB, carcinogenic risk refers to the increased probability that an individual exposed to an average air concentration of a chemical will develop cancer when exposed over a 70-year period. Cancer risks are expressed on a per-million basis for comparative purposes. According to the SCAQMD Multiple Air Toxics Exposure (MATES-II) Study, diesel particulates account for 71 percent of the cancer risks (1,400 in one million) relating to pollutants in the South Coast Air Basin. According to the MATES-II study, individuals in areas of maximum risk are 14 times more likely to contract cancer due to diesel emissions. Figure 30 displays the cancer risk from airborne toxics including diesel emissions for the counties of Los Angeles, Orange, Riverside, San Bernardino, and Ventura.[2]

Figure 29
Cancer Risk
Los Angeles and Vicinity

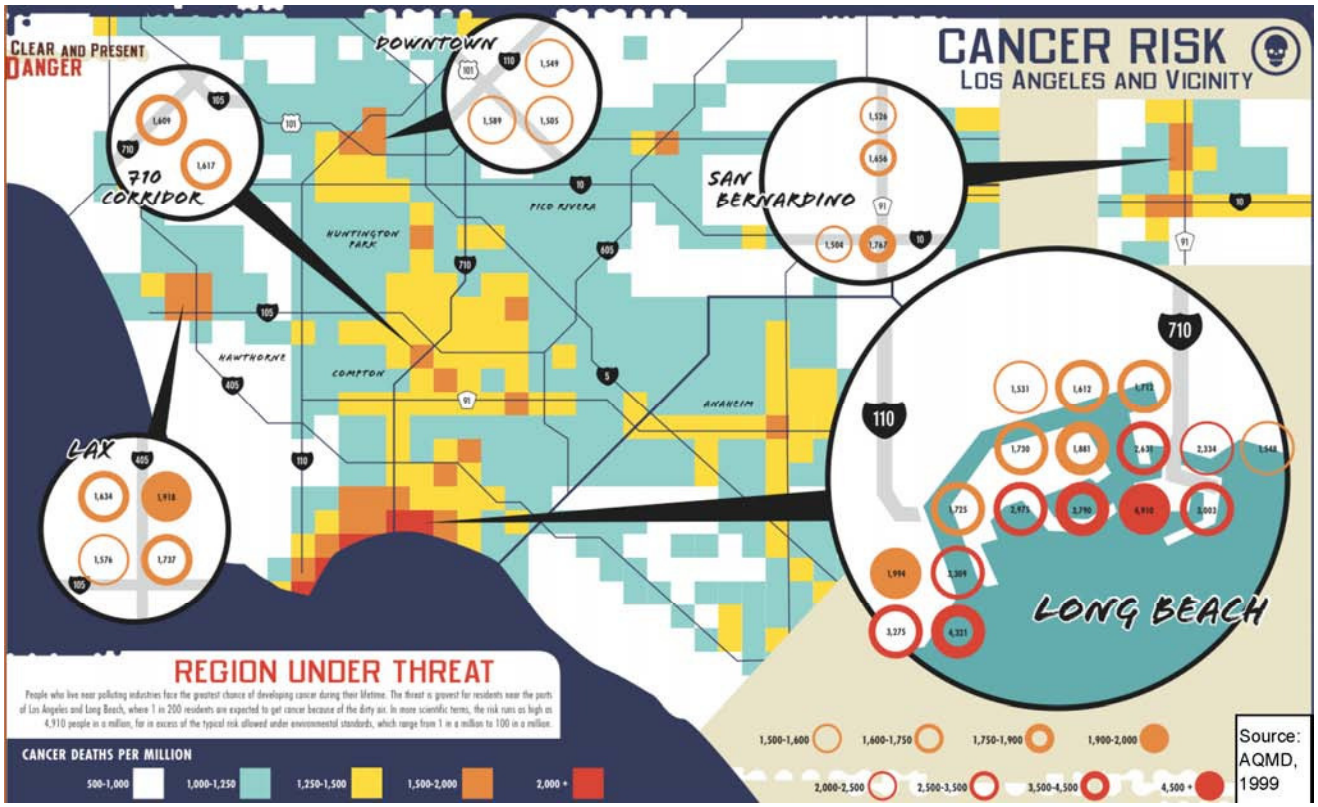
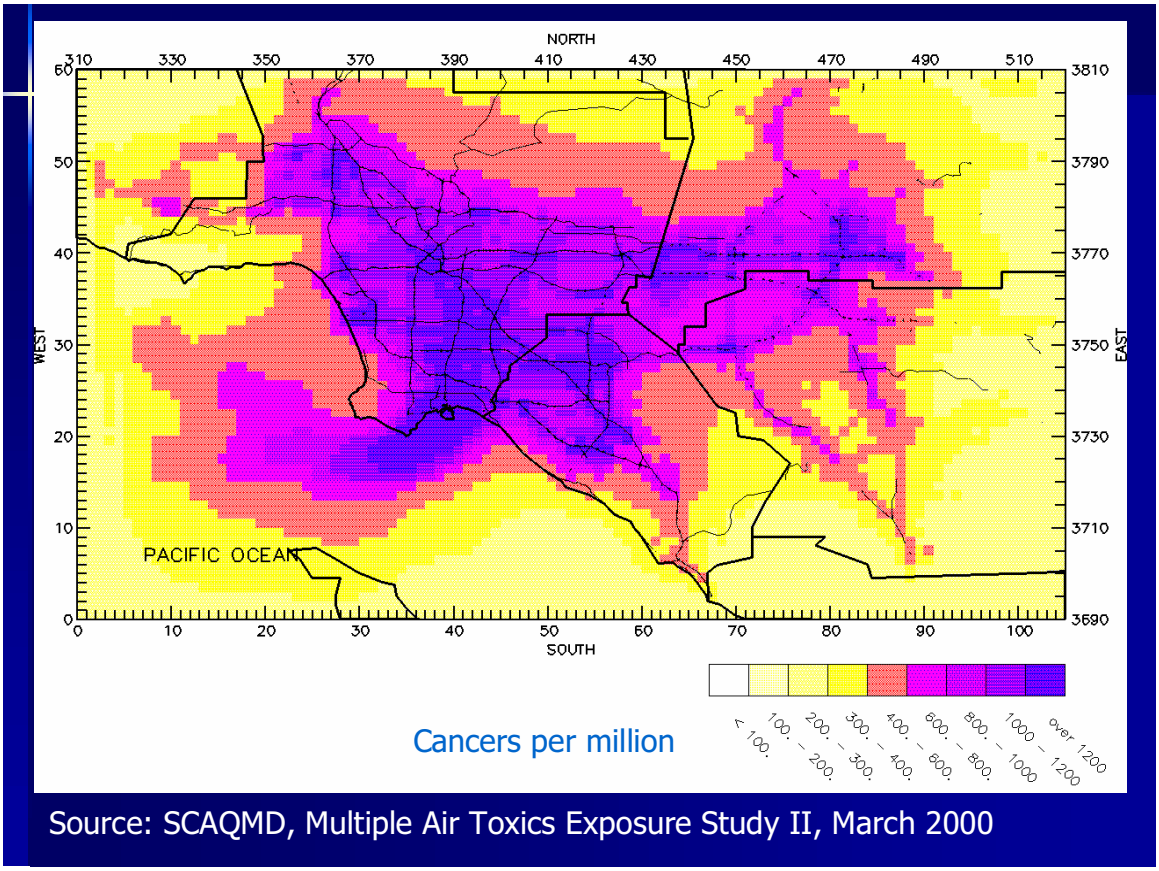


Figure 30
Estimated Risk of Cancer from All Toxics: All Emission Sources



To date there have been landmark environmental mitigation plans, described later in this section, targeting air pollution and diesel emissions from goods movement sources to protect public health and improve air quality. As an example, the 2007 South Coast Air Quality Management District's Air Quality Management Plan (AQMP) proposes broad control measures for key goods movement pollutants (e.g., diesel particulates, sulfur oxides and nitrogen oxides) to attain federal annual PM2.5 and 8 hour ozone ambient air quality standards by applicable deadlines (2015 and 2023, respectively) and to reduce local toxic risks.

A standard establishes the concentrations above which a pollutant is known to cause adverse health effects to sensitive groups within the population, such as children and the elderly. An ambient air quality standard is the definition of "clean air." Area designations for federal ambient air quality standards for each of the MCGMAP counties are summarized in Table 19. The federal nonattainment designations shown in the table are ranked in decreasing order of severity as Extreme, Severe 17, Severe 15, Serious, Moderate, and Marginal. San Diego County is ranked as Basic (Subpart 1), which means it is an area that was previously reaching attainment status before changes to the 8-hour Ozone standard and is on a less-prescriptive timeline than the other attainment designations. As shown in Table 19, much of the study area is in nonattainment for ozone and particulate matter.

Table 19
Federal Nonattainment Designations per Criteria Pollutants

County[a]	POLLUTANT[b]					
	Ozone (8 Hr.)	PM10	PM2.5	NO_2	SO_2	CO
Los Angeles	Severe 17[c] / Moderate	Serious	Nonattainment	-	-	-
Orange	Severe 17[c]	Serious	Nonattainment	-	-	-
Riverside	Severe 17[cd] / Serious	Serious	Nonattainment	-	-	-
San Bernardino	Severe 17[c] / Moderate	Serious / Moderate	Nonattainment	-	-	-
Ventura	Moderate	-	-	-	-	-
Imperial	Marginal[e]	Serious	-	-	-	-
San Diego	Basic (Subpart 1)	-	-	-	-	-

Notes:

[a] Some designations only apply to portions of counties and vary by basin, hence multiple designations.

[b] Current EPA Nonattainment Designations for All Criteria Pollutants Accessed July 13, 2007 at http://www.epa.gov/oar/oaqps/greenbk/ancl.html .

[c] The SCAQMD has requested this designation for the portions in the South Coast Air Basin be redesignated Extreme.

[d] The SCAQMD has requested this designation for portions of the Salton Sea Air Basin in the Coachella Valley be designated Severe-15.

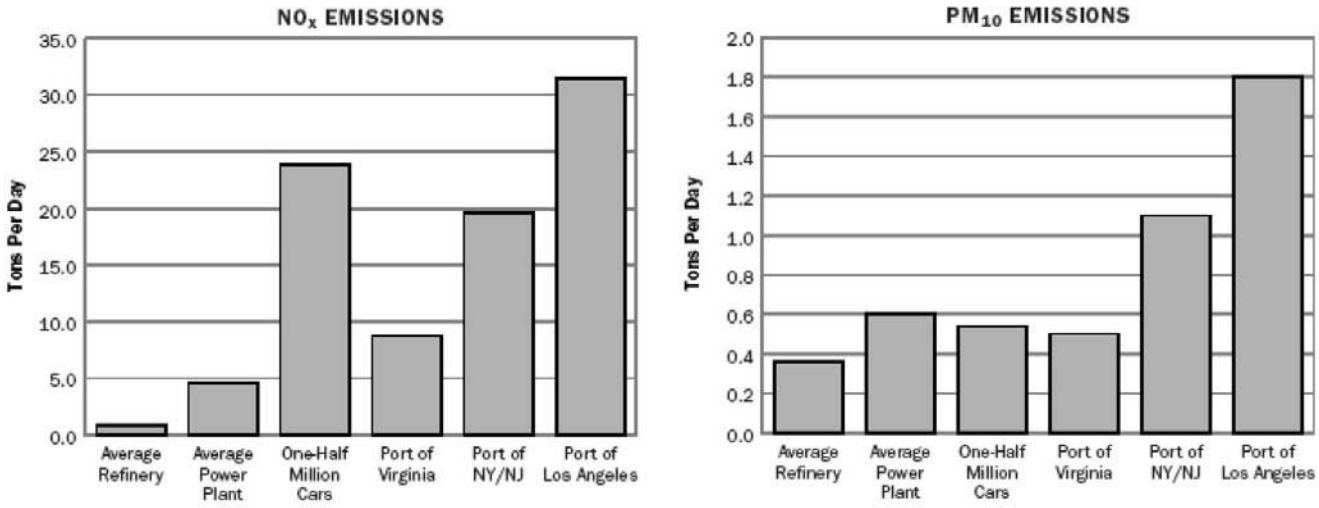
[e] Imperial county did not attain the 8-hour ozone attainment standard of June 15, 2007. This designation will be reclassified by EPA as Moderate when its findings are finalized.

Source: Wilbur Smith Associates, 2007.

Figure 31 shows that toxic air contaminates and other emissions are generated in a much larger percentage near the Ports of Los Angeles and Long Beach as compared to other national port facilities, refineries, power plants, and cars.

Figure 31

Nitrogen Oxides (NO_x) and Particulate Matter (PM_{10}) Pollution from Ports Compared to Refineries, Power Plants, and Cars

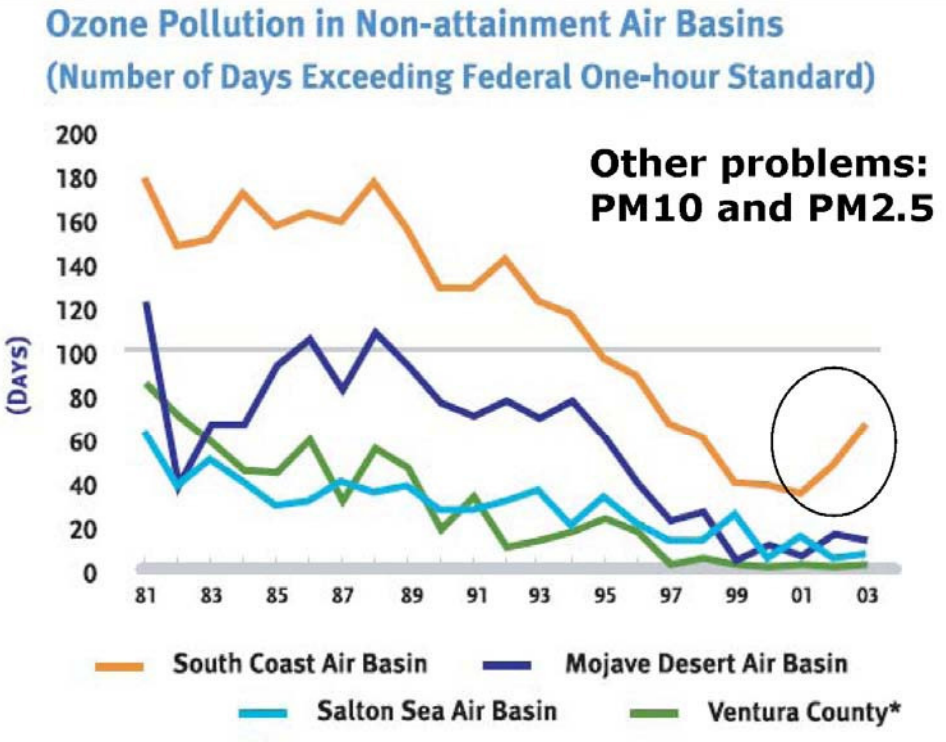


Sources: Seaports of the Americas, American Association of Port Authorities Directory (2002): 127. U.S. EPA, National Emission Trends, Average Annual Emissions, All Criteria Pollutants, 1970–2001, August 13, 2003. Energy Information Administration, Petroleum Supply Annual 1982, Volume 1, DOE/EIA-0340(82)/1 (June 1983, Washington, DC), pp. 97-103 and Petroleum Supply Annual 2000, Volume 1, DOE/EIA-0340(2000)/1 (Washington, DC, June 2001), Table 40. Energy Information Administration, Form EIA-861, "Annual Electric Utility Report." As posted at www.eia.doe.gov/cneaf/electricity/public/t01p01.txt, U.S. Dept of Transportation, Federal Highway Administration, 2000 Highway Statistics, State Motor-Vehicle Registrations.

Figure 32 highlights the following issues:

- Ozone pollution is again on the rise, most likely due to NOx precursor emissions from diesel emissions.
- Although PM10 is a concern, the current health focus is on PM2.5 and ultrafine particulates.

Figure 32

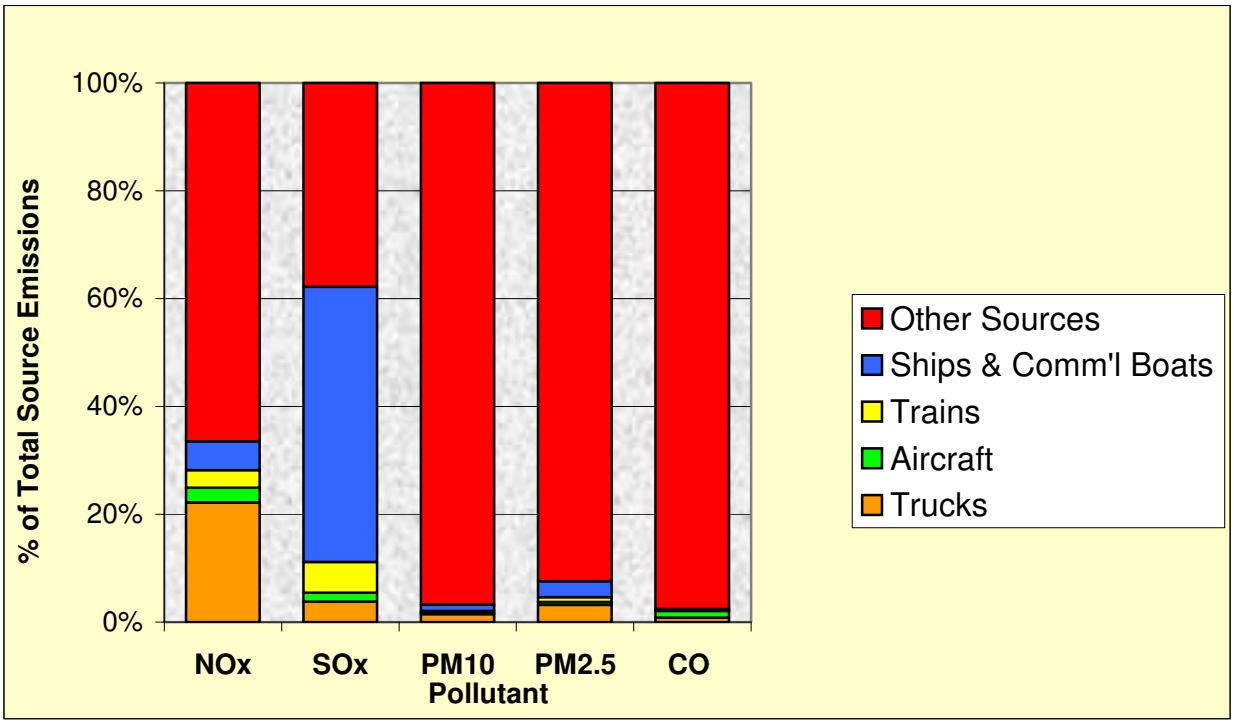


** Ventura County is part of the South Central Coast Air Basin*

Source: California Air Resources Board and South Coast Air Quality Management District

Figure 33 shows the estimated emission sources for the Year 2005 which includes the goods movement industry.

Figure 33
2005 Estimated Annual Average Emissions in South Coast Air Basin



Source: Final 2003 Air Quality Management Plan. South Coast Air Quality Management District.

As referenced earlier and indicated in Figure 33, the goods movement industry is a major contributor to the South Coast Air Basin (SCAB) emissions, especially nitrogen oxide (NOx) and sulfur oxide (Sox). Other emission sources contributing to the basin's degraded air quality, as reported by the South Coast Air Quality Management District (SCAQMD) include:

- On-Road Mobile – automobiles and lighter duty trucks. (Excludes heavy, heavy duty (HHD) trucks accounted for in goods movement truck category.)
- Other Mobile – off road sources, such as recreational boats, off-road recreational vehicles, and farm equipment. (Excludes goods movement categories of aircraft, trains, and ships.)
- Stationary and Area – numerous sources, such as utilities, oil and gas production, waste disposal, cleaning and surface coating, industrial processes (e.g., food and agriculture, electronics, and wood and paper), and solvent evaporation.

The percentage contribution of these emission sources in comparison to the goods movement industry is presented in Table 20. The table indicates trucks account for over 20 percent of the NOx emissions. Ships and commercial boats account for over 50 percent of the SOx emissions.

Table 20
2005 Estimated Annual Average Emissions in South Coast Air Basin
(Percent of Total)

SOURCE	POLLUTANT				
	NOx	SOx	PM10	PM2.5	CO
Goods Movement	33.5%	62.2%	3.3%	7.6%	2.4%
On-Road Mobile	37.3%	4.3%	5.1%	8.4%	65.1%
Other Mobile	19.1%	0.9%	5.3%	12.0%	27.4%
Stationary & Area	10.0%	32.6%	86.3%	72.1%	5.1%

Source: Final 2003 Air Quality Management Plan. South Coast Air Quality Management District.

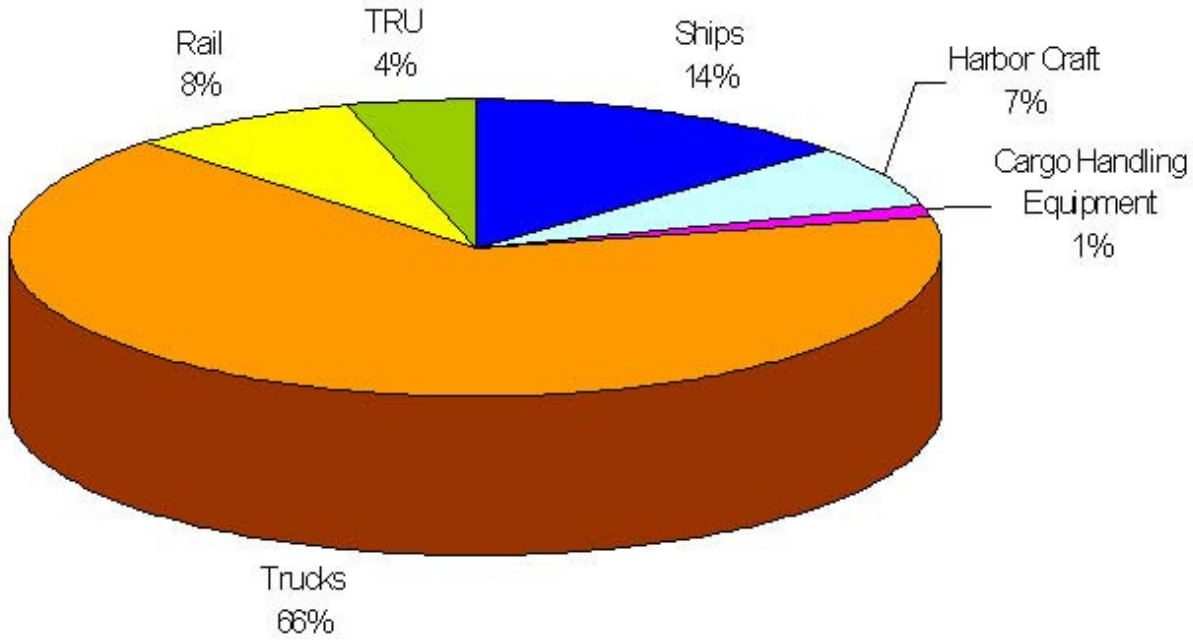
As shown in Figure 34, statewide 2001 diesel PM emissions inventory from ports and goods movement were approximately 57 tons per day, with modal contributions as follows: 66 percent truck emissions, 8 percent rail, 14 percent ships, 7 percent harbor craft, 4 percent transport refrigeration units (TRU), and 1 percent cargo handling equipment.[3]

The counties within the MCGMAP region are actively trying to identify the sources for air quality impacts and develop plans to reduce the air quality impacts of goods movement. The San Diego 8-Hour Ozone Plan was approved by the California Air Resources Board (CARB) on May 24, 2007 and was sent to the Environmental Protection Agency (EPA) for approval. This plan revealed that since 2003 transported pollution from the South Coast Air Basin has contributed to the county exceeding its 8-hour ozone standard. San Diego experienced an increase in 2006 of the number of days over the standard even though ozone-forming emissions have declined. The two air basins are intrinsically linked.

The CalEPA and CARB Goods Movement Reduction Plan of March 21, 2006 found that "…goods movement emissions in the South Coast represent about 25 percent of the statewide good movement inventory. Currently trucks are the dominant source of diesel PM and NOx. As adopted regulations continue to be implemented, truck emissions are projected to decrease. Ship emissions are projected to increase by a factor of three, based on projected container growth at the Ports of Los Angeles and Long Beach. Truck and other categories will still generate significant emissions in 2020".

The significance of diesel particulate matter relating to health is firmly established. Diesel particulate matter is a cause for special concern to human health because 50 to 90 percent of the particles are very small (i.e., ultrafine[4]) and can readily enter into and deposit within the lungs and pass through the bloodstream to the cellular level. However, it should be noted that ultrafine particulate matter is not exclusive to diesel emissions – ultrafine particles originate from any combustion process using any fuel, including gasoline, compressed natural gas (CNG), and liquid natural gas (LNG). Combustion sources other than mobile sources include stationary, industrial, occupational, and atmospheric conversion.[5] Independently published research reinforces the emissions health risks by establishing a diesel exhaust-cancer connection. In more than 35 studies involving railroad workers exposed to occupational diesel exhaust, the excess risk of lung cancer is consistently elevated by 20 to 50 percent.[6]

Figure 34
Diesel PM Statewide 2001 Emissions from Ports and Goods Movement



Source: Emission Reduction Plan for Ports and Goods Movement in California. California EPA and California Air Resources Board. March 21, 2006.

Further, according to research compiled by the Keck School of Medicine of USC[7] health effects are attributable to diesel particulate matter and increased incidences of:

- Asthma
- Preterm and low birth weight babies
- Cardiac birth defects
- Thickening of arterial walls
- Oropharyngeal (mouth and throat) cancer
- Slowed lung development in children

As referenced earlier, this is of particular concern when goods movement facilities and corridors are located near homes and schools. Figures 35-37 show schools and residential land uses along goods movement corridors throughout the study area. Additionally, recent CARB analysis reveal that there have been 2,400 premature deaths (defined as up to 14 years premature of average mortality rate) statewide, with 1,200 each year in the South Coast Air Basin due to PM2.5 pollution. CARB previously estimated that 2,400 people die prematurely each year due to PM2.5 exposure in the South Coast Air Basin.

Schools
0 - 150 meters
150 - 300 meters
Residential Land within 1/4 mile
Ports
Airports
Major highways
Railroads
County

Transportation Facility Corridors

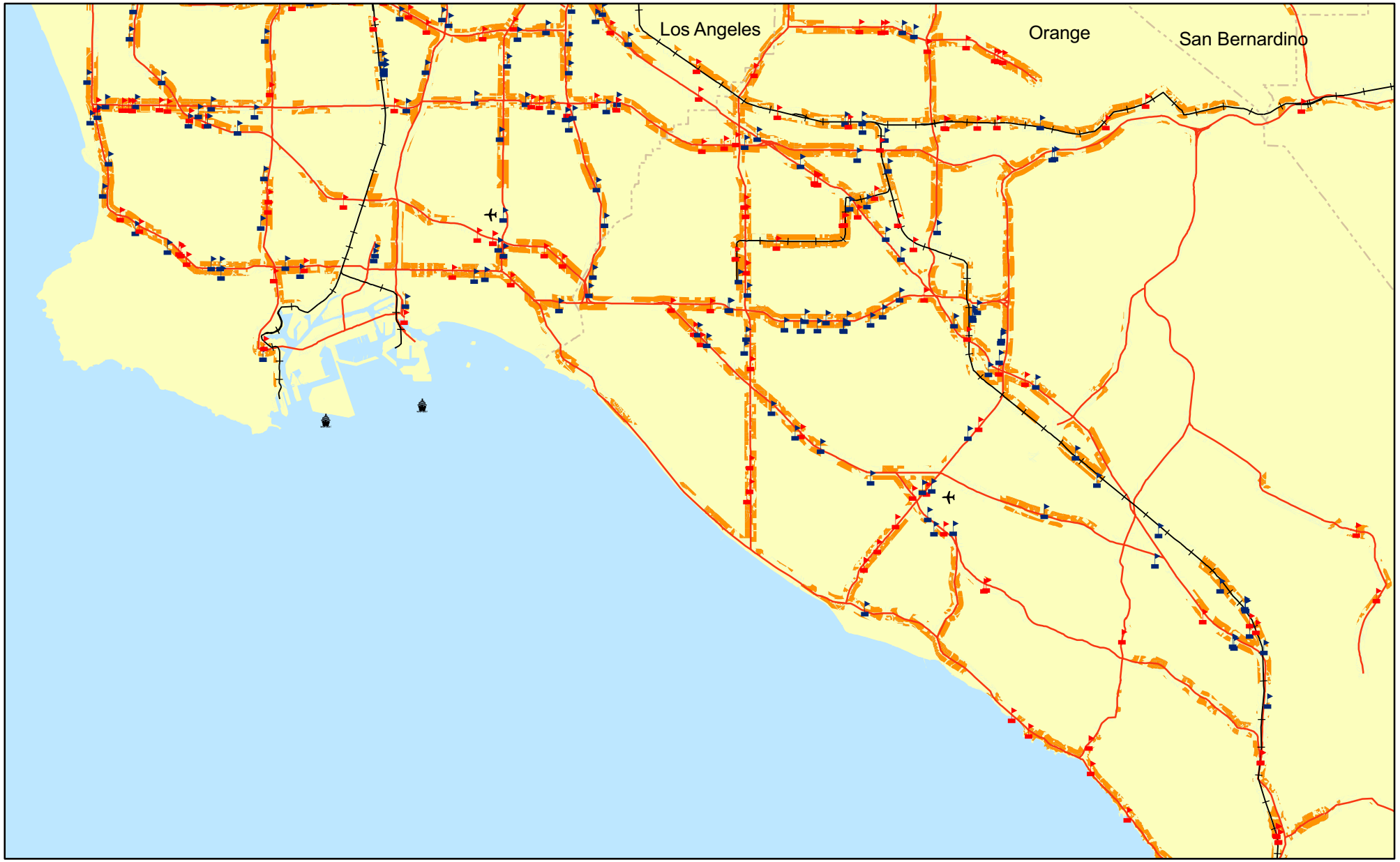
Schools and Residential Landuse
Central Los Angeles County

0 2 4 8 Miles

Figure 35

ENGINEERS PLANNERS ECONOMISTS
WilburSmith ASSOCIATES

Source: TeleAtlas StreetMap USA
SCAG 2000 Land Use



Schools
0 - 150 meters
150 - 300 meters
Residential Land within 1/4 mile
Ports
Airports
Major highways
Railroads
County

Transportation Facility Corridors

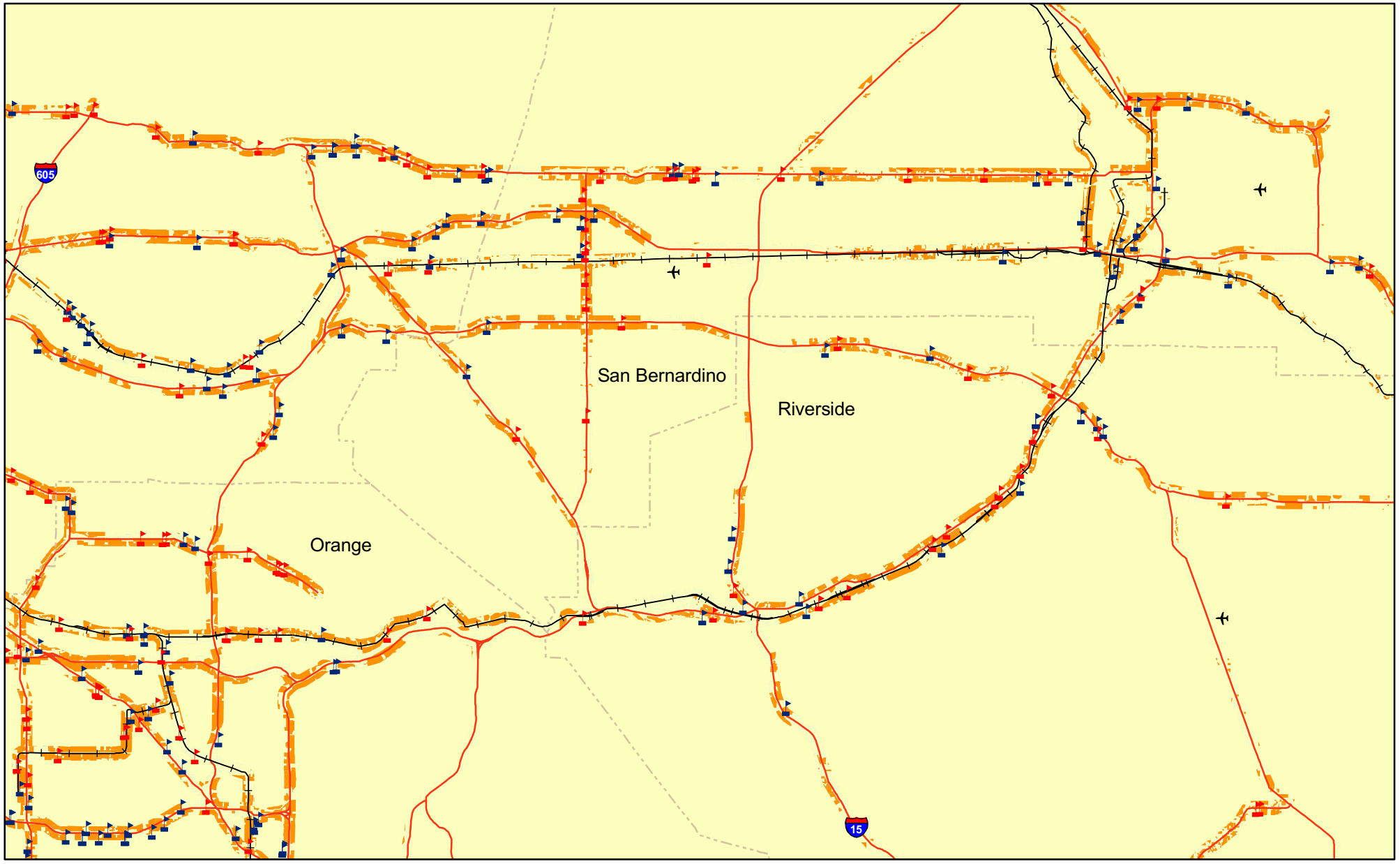
Schools and Residential Landuse
Orange County

0 2 4 8 Miles

Figure 36

ENGINEERS PLANNERS ECONOMISTS
WilburSmith ASSOCIATES

Source: TeleAtlas StreetMap USA
SCAG 2000 Land Use



Schools
0 - 150 meters
150 - 300 meters
Residential Land within 1/4 mile
Ports
Airports
Major highways
Railroads
County

Transportation Facility Corridors

Schools and Residential Landuse
Western San Bernardino and Riverside

0 2 4 8 Miles

Figure 37

ENGINEERS PLANNERS ECONOMISTS
WilburSmith ASSOCIATES

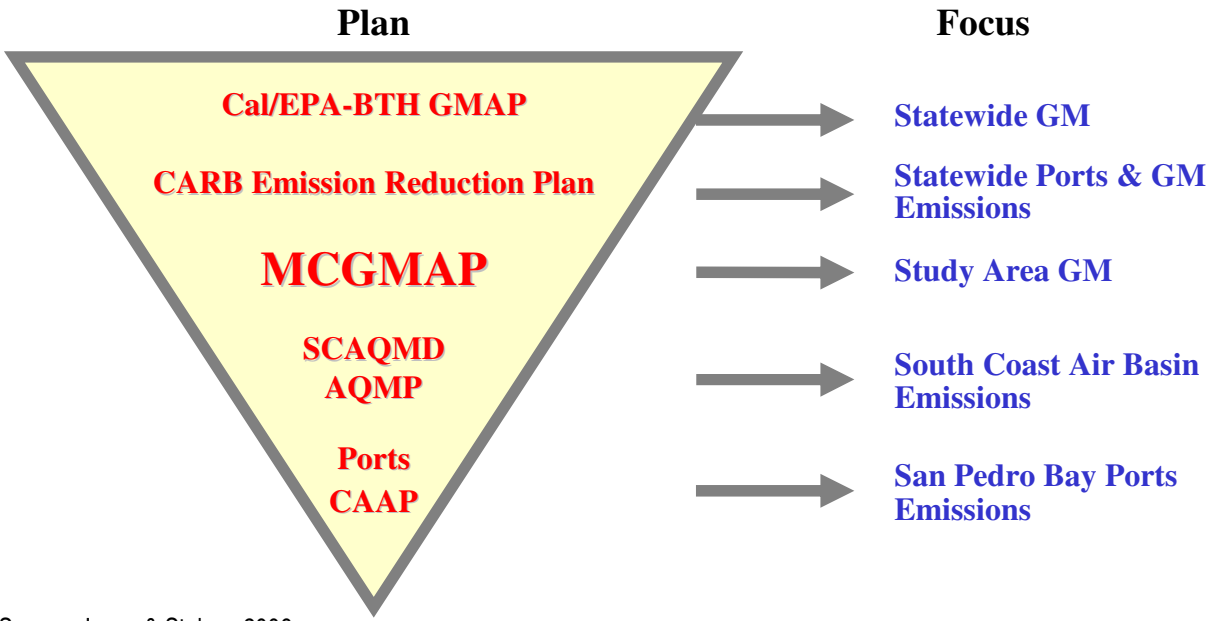
Source: TeleAtlas StreetMap USA
SCAG 2000 Land Use

Current Environmental Protection Efforts

The study area covers a large geographic area that contains a wide variety of topography, air, water, and other environmental characteristics. Due to its unique geographic location, the state's environmental quality and control is shared by international treaties, federal, state, and regional agencies. There are approximately 30 agencies with jurisdiction over a broad range of environmental impacts. Landmark environmental legislation includes the Clean Air Act, Clean Water Act, and Noise Control Act; however, it is the reduction of air pollutants via cleaner fuels, operational changes, and technological improvements that has received the primary focus. A comprehensive list of regulatory agencies, jurisdictions, and responsibilities are included in Table 1 of Appendix B . The six county study area (and Imperial County) encompasses four of California's 15 air basins and four of California's 35 Air Quality Management Districts as described in Table 2 of Appendix B.

California transportation agencies are aggressively addressing goods movement emissions. Four landmark plans are currently shaping and influencing the goods movement industry within the study area as follows: (1) California EPA (Cal/EPA) and the Business, Transportation, and Housing Agency (BTH) *Goods Movement Action Plan Phase II Progress Report: Draft Framework for Action* (March 2006), (2) CARB *Emission Reduction Plan for Ports and Goods Movement in California* (March 2006), (3) SCAQMD *2003 Air Quality Management Plan*, and (4) the Ports of Long Beach and Los Angeles *San Pedro Bay Ports Clean Air Action Plan* (Draft – June 2006). The Action Plan is intended to supplement the above referenced plans. The focus for each agency's plan is presented in Figure 38. Note that as of the date of completion of the final MCGMAP, many of these Draft plans have been finalized by the respective agencies.

Figure 38
Focus of Agency Plans



Source: Jones & Stokes, 2006.

An overview of some of the plans within the study area follows:

1-The California Environmental Protection Agency (Cal/EPA) and Business Transportation and Housing Agency (BTH) Goods Movement Action Plan is a statewide goods movement action plan proposed by the governor to generate jobs, increase mobility and relieve traffic congestion, improve air quality and to protect public health, enhance public and port safety, and improve California's quality of life. The plan addresses goods movement infrastructure and operations, as well as air quality emission reduction efforts. The state's action plan is based upon CARB's Emission Reduction Plan and, establishes the following goals:

- Reduce emissions to Year 2001 levels by 2010.
- Continue reducing emissions past Year 2001 levels until attainment of applicable standards is achieved.
- Reduce diesel-related health risks by 85 percent by Year 2020.
- Ensure sufficient localized air toxics risk reductions in each affected community.

Funding of the state's estimated fifteen billion dollar ($15 billion) action plan is proposed to include: $1.95 billion in previously committed public funding; a proposed bond (S.B. 1266 – Highway Safety, Traffic Reduction, Air Quality, & Port Security Bond Act of 2006) encompassing $2 billion for trade corridor improvement projects with 1:1 matching, plus $1 billion for air quality improvements (no matching requirement); and suggested funding strategies (regulations, incentives, federal funding, user-based fees, and market-based approaches). A key component of the plan is the simultaneous and continuous improvement in infrastructure and mitigation. As defined by the state of California, "the total cost of a goods movement related infrastructure project should include the cost of required project-specific mitigation and the combined cost should be funded as the cost of the project". A preliminary working list of candidate projects has been developed based on criteria. Examples of goods movement infrastructure projects include dock-rail facilities, the Alameda Corridor East and rail capacity improvements (Table 3 of Appendix B).

2-The California Air Resources Board (CARB) Emission Reduction Plan focuses on statewide emission reductions specifically from ports and the goods movement industry. Whereas the Cal/EPA-BTH action plan addresses both infrastructure projects and air quality projects, CARB's plan focuses solely on air quality per their legislative purview. While the plans are consistent with one another, the Emission Reduction Plan is broader in terms of air quality efforts. Overall goals of the CARB plan include:

- Reduce total statewide international and domestic goods movement emissions back to Year 2001 levels or below by Year 2010.
- Reduce statewide diesel particulate matter health risk from goods movement by 85 percent by Year 2020.
- Reduce NOx emissions from international goods movement in the South Coast by 30 percent from projected Year 2015 levels, and 50 percent from projected Year 2020 levels (based on preliminary targets for attaining federal air quality standards).
- Apply plan strategies statewide to aid all regions in attaining air quality standards.

To meet these goals, the plan's regulatory strategies include several measures, including:

- More stringent emissions standards
- Cleaner fuels
- Shore power
- Speed reduction of ships
- Engine upgrades and retrofits
- Emissions control devices

Implementation of the Emission Reduction Plan is estimated to cost $6 to $10 billion over 15 years. CARB estimates that the economic benefits in terms of the savings via the avoidance of adverse health impacts over the same time period are $34 to $47 billion. Funding of the plan assumes all industries involved must share in investment costs, and is generally unfunded by CARB itself. The agency, however, does acknowledge that incentives are critical to some sectors, and has also proposed the creation of a special $5 million annual fund for goods movement demonstration projects. In addition to incentives, possible funding strategies include the state's proposed bond (S.B. 1266), container fees, federal funding, other user fees, and market-based approaches.

3-The Southern California Air Quality Management District 2003 Air Quality Management Plan (AQMP) is a mandated document that develops emissions budgets for the State Implementation Plan (SIP) conformity with state and national ambient air quality standards. The SIP is ultimately approved by the U.S. EPA to satisfy requirements of the federal Clean Air Act following approval by CARB. One of the Air Resources Board (ARB) responsibilities is to propose the state and federal strategy for the SIP to reach the federal standards. The SIP is a comprehensive strategy designed to attain federal air quality standards as quickly as possible through a combination of technologically feasible and cost-effective measures. It outlines ARB staff's assessment of how far adopted regulations will take us towards attainment of federal standards, what new actions could be taken, how the timing of new technology and incentive funds comes into play, and what the earliest feasible timeframes for meeting standards is likely to be in each region.[8] Goods movement-related [mobile source] emissions projections are integral to the AQMP. SCAQMD's air pollution control strategy focuses on controlling man-made sources through technologies and management practices, and relies on mobile source control measures developed by CARB.

SCAQMD acknowledges the importance of a multi-agency approach in addressing long-term air quality improvements. The SCAQMD reports "to ultimately achieve ambient air quality standards and demonstrate attainment, additional long-term emission reductions will be necessary from sources including those primary under the jurisdiction of California Air Resource Board (e.g., on-road motor vehicles, off-road equipment, and consumer products) and U.S. Environmental Protection Agency (e.g., aircraft, ships, trains, and pre-empted off-road equipment.) Without adequate and fair share level of reductions from all sources, the emission reduction burden would unfairly be shifted to sources that have otherwise done their part for clean air."[9]

Clean air progress is a challenging task that must account for complex interactions between emissions and resulting air quality, but also to pursue the most effective possible set of air quality improvement strategies while maintaining a healthy economy.[10] To ensure continued progress toward clean air and compliance with state and federal requirements, the AQMP is developed by SCAQMD in conjunction with CARB, SCAG, and the U.S. EPA. Every three years, AQMD revises the AQMP for air quality improvement. Each iteration of the plan is an update of the previous plan and has a 20-year horizon. The previous 2003 AQMP focuses on demonstrating attainment with the federal PM10 ambient air quality standard by 2006 and with the federal 1-hour ozone standard in Year 2010 while making notable progress toward attainment of state standards and upcoming new federal standards. The 2007 Plan was in progress during the analysis and research for this plan. The 2007 Plan was completed on June 1, 2007. Its focus, in part, is new federal 8-hour ozone and PM2.5 standards.

4-The San Pedro Bay Ports Clean Air Action Plan (CAAP) is the most recently developed plan to target goods movement emissions at the San Pedro Bay Ports of Los Angeles and Long Beach. Jointly developed with the SCAQMD, the Ports released the draft plan in June 2006, which is expected to be approved by the Ports' governing boards in September of the same year. Excerpts of the CAAP can be found in Table 4 of Appendix B .

The CAAP established attainment standards on three levels: San Pedro Bay standards, project specific standards, and source specific performance standards. Trucks, ships (ocean going vessels), rail, harbor craft, and cargo handling equipment are targeted for various control measure and initiatives, including:

- Improvements to engine performance standards, alternate fuels and power, and emission reductions
- Technology Advancement Program
- Infrastructure and operational efficiency improvements
- Tracking and monitoring

Several implementation strategies are outlined in the CAAP:

- Lease requirements
- Tariff charges
- CEQA mitigations
- Incentives
- Voluntary measures
- Credit trading
- Capital lease backs
- Government-backed loan guarantees for trucks

The CAAP targets the annual reduction of specific pollutants. For example, the plan anticipates a reduction in NOx by 13,090 tons per year (TPY), diesel particulate matter by 1,242 TPY, and SOx by 2,721 TPY. To accomplish these goals, the CAAP encompasses a 5-year program at an estimated cost of $1.98 billion.[11] Initially committed funding to be provided by the ports and SCAQMD totals $394.4 million, resulting in a potential shortfall of approximately $1.6 billion. This shortfall may be addressed in part by the state's trade corridor improvement fund component of Prop 1B.